

Application No.: 10/055,580

Docket No.: JCLA8676-R

AMENDMENTS**In The Claim:****Claims 1-77 (canceled)**

78. (currently amended) A bonding structure positioned on a pad of a chip, wherein the bonding structure is adapted to be bonded on a pad of a substrate, the substrate has a patterned solder mask, and the patterned solder mask layer has at least one opening that exposes the pad of the substrate, the bonding structure comprising:

a conductive pillar positioned over the pad of the chip; and

a solder cap positioned over the conductive pillar, wherein the solder cap has a largest transverse dimension smaller than ~~that~~ the transverse dimension of the opening in the patterned solder mask, and the largest transverse dimension of the solder cap is smaller than a transverse dimension of the conductive pillar, wherein the solder cap is formed over the conductive pillar before the solder cap is bonded to the pad of the substrate.

79. (previously presented) The structure of claim 78, wherein the material of the conductive pillar comprises copper.

80. (previously presented) The structure of claim 78, wherein the material of the conductive pillar comprises tin-lead alloy.

81. (previously presented) The structure of claim 78, wherein material forming the conductive pillar is selected from a group consisting of tin, lead, copper, gold, silver, zinc, bismuth, magnesium, antimony, indium and an alloy of the aforementioned metals.

Application No.: 10/055,580

Docket No.: JCLA8676-R

82. (previously presented) The structure of claim 78, wherein material forming the solder cap is selected from a group consisting of tin, lead, copper, gold, silver, zinc, bismuth, magnesium, antimony, indium and an alloy of the aforementioned metals.

83. (previously presented) The structure of claim 78, further comprising a metallic layer positioned between the conductive pillar and the pad of the chip, wherein the material of the metallic layer comprises titanium, tungsten, chromium, copper, nickel, cobalt, silver, gold, tin, vanadium, palladium or an alloy of some of the aforementioned metals.

84. (canceled)

85. (currently amended) A bonding structure ~~positioned on a pad of a chip~~, comprising:
a conductive pillar positioned over the a pad of the a chip, wherein the conductive pillar comprises copper; and

a solder cap positioned over the conductive pillar, ~~the solder cap having a side wall, all of which is exposed~~, wherein the solder cap has a largest transverse dimension smaller than the a transverse dimension of the conductive pillar.

86. (canceled)

87. (previously presented) The structure of claim 85, wherein the material of the conductive pillar comprises tin-lead alloy.

88. (previously presented) The structure of claim 85, wherein material forming the conductive pillar is selected from a group consisting of tin, lead, copper, gold, silver, zinc, bismuth, magnesium, antimony, indium and an alloy of the aforementioned metals.

Application No.: 10/055,580

Docket No.: JCLA8676-R

89. (previously presented) The structure of claim 85, wherein material forming the solder cap is selected from a group consisting of tin, lead, copper, gold, silver, zinc, bismuth, magnesium, antimony, indium and an alloy of the aforementioned metals.

90. (previously presented) The structure of claim 85, further comprising a metallic layer positioned between the conductive pillar and the pad of the chip, wherein the material of the metallic layer comprises titanium, tungsten, chromium, copper, nickel, cobalt, silver, gold, tin, vanadium, palladium or an alloy of some of the aforementioned metals.

91. (previously presented) The structure of claim 85, further comprising a transition layer positioned between the conductive pillar and the solder cap, wherein the transition layer comprises at least one conductive layer.